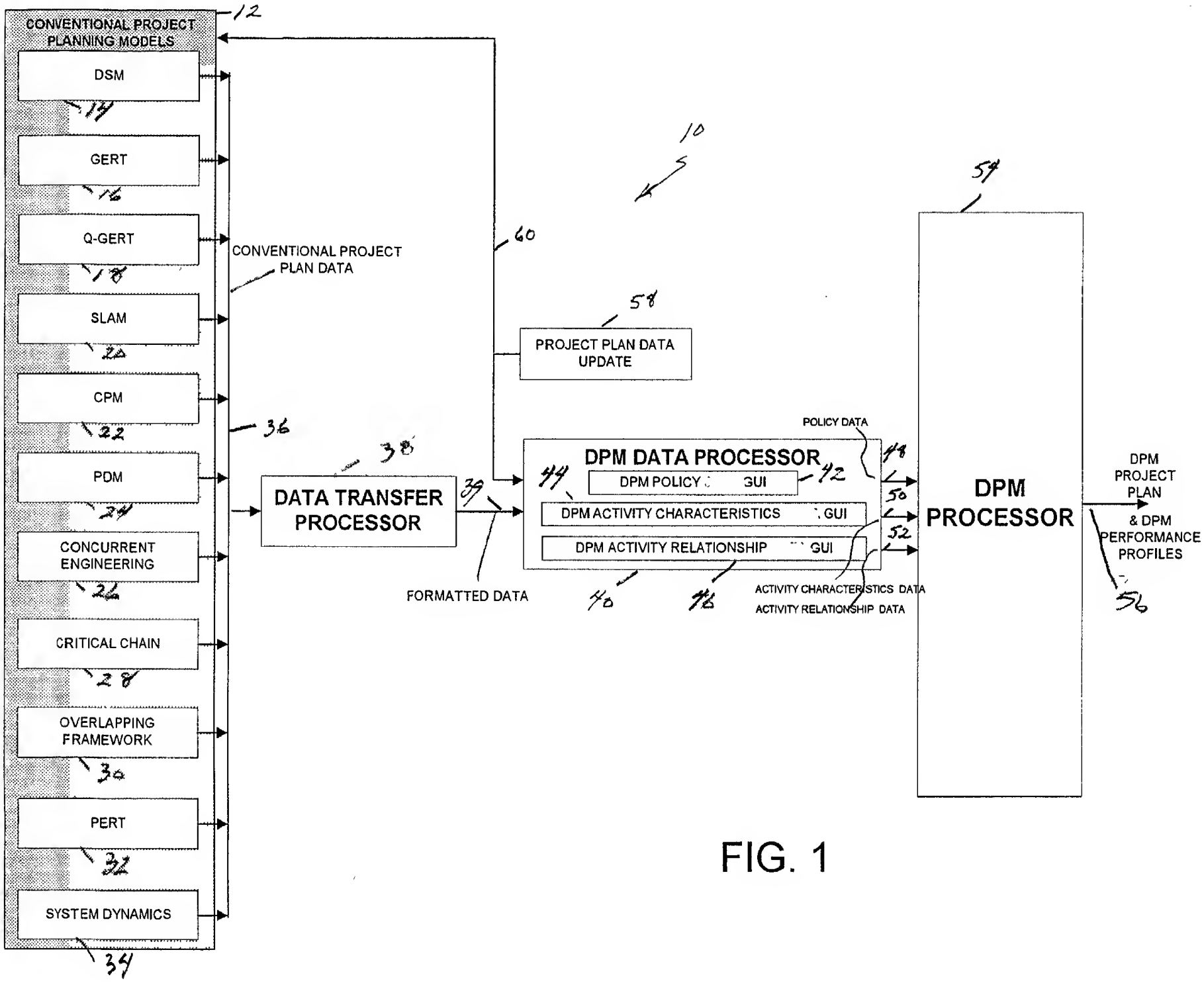

CONVENTIONAL PROJECT PLANNING MODELS
12
DSM
14
GERT
16
Q-GERT
18
SLAM
20
CPM
22
PDM
24
CONCURRENT ENGINEERING
26
CRITICAL CHAIN
28
OVERLAPPING FRAMEWORK
30
PERT
32
SYSTEM DYNAMICS
34
10
CONVENTIONAL PROJECT PLAN DATA
36
60
58
PROJECT PLAN DATA UPDATE
38
DATA TRANSFER PROCESSOR
39
FORMATTED DATA
40
DPM DATA PROCESSOR
44
DPM POLICY GUI
42
DPM ACTIVITY CHARACTERISTICS GUI
DPM ACTIVITY RELATIONSHIP GUI
46
POLICY DATA
48
50
52
ACTIVITY CHARACTERISTICS DATA
ACTIVITY RELATIONSHIP DATA
54
DPM PROCESSOR
DPM PROJECT PLAN
& DPM PERFORMANCE PROFILES
56

FIG. 1

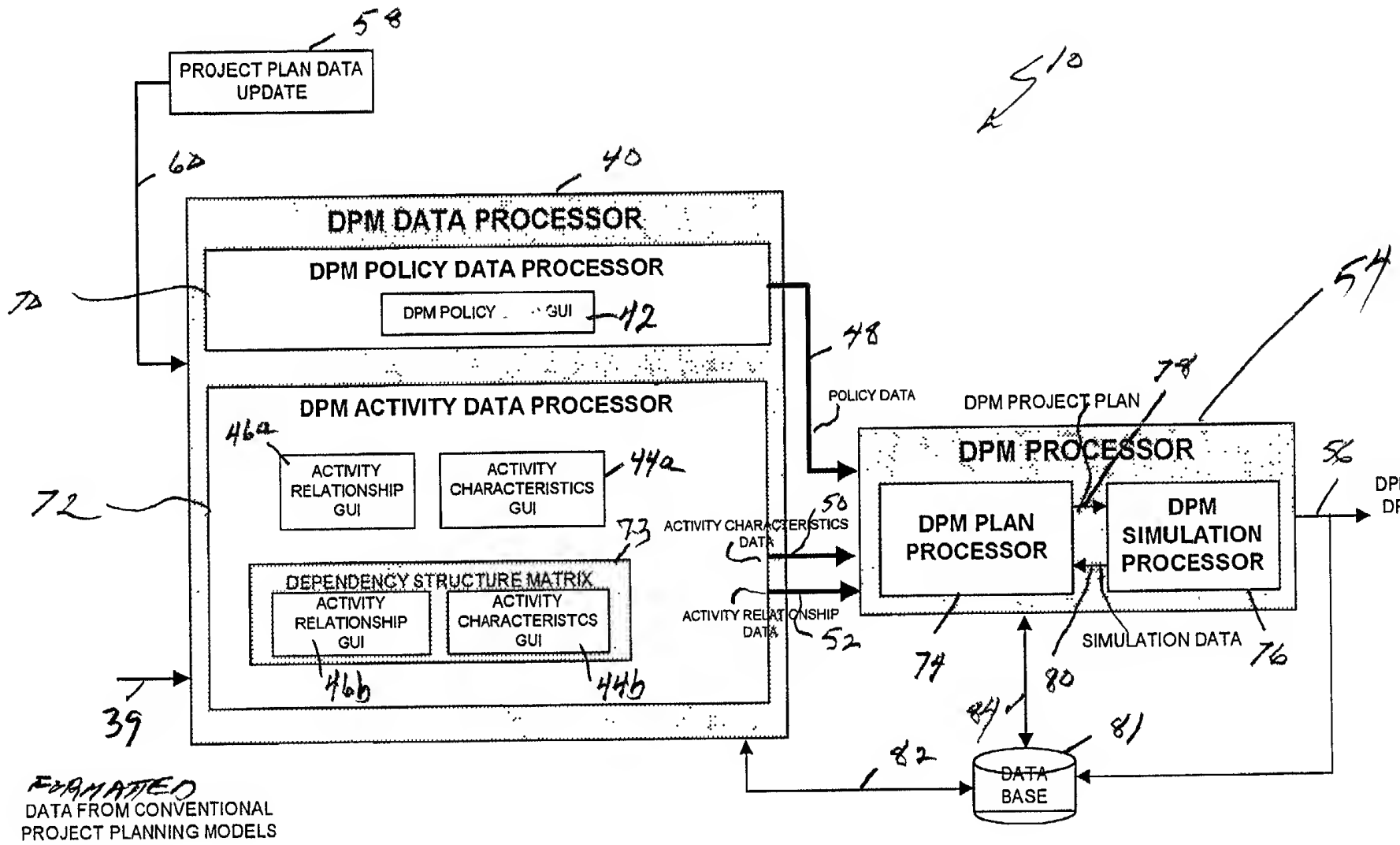

PROJECT PLAN DATA UPDATE
58
60
40
DPM DATA PROCESSOR
DPM POLICY DATA PROCESSOR
DPM POLICY GUI
42
70
48
POLICY DATA
DPM ACTIVITY DATA PROCESSOR
46a
ACTIVITY RELATIONSHIP GUI
ACTIVITY CHARACTERISTICS GUI
44a
72
73
DEPENDENCY STRUCTURE MATRIX
ACTIVITY RELATIONSHIP GUI
ACTIVITY CHARACTERISTCS GUI
46b
44b
39
FORMATTED DATA FROM CONVENTIONAL PROJECT PLANNING MODELS
ACTIVITY CHARACTERISTICS DATA
50
ACTIVITY RELATIONSHIP DATA
52
DPM PROJECT PLAN
78
54
DPM PROCESSOR
DPM PLAN PROCESSOR
DPM SIMULATION PROCESSOR
56
DPM PROJECT PLAN & DPM PERFORMANCE PROFILES
74
80
SIMULATION DATA
76
84
82
81
DATA BASE
10

FIG. 2

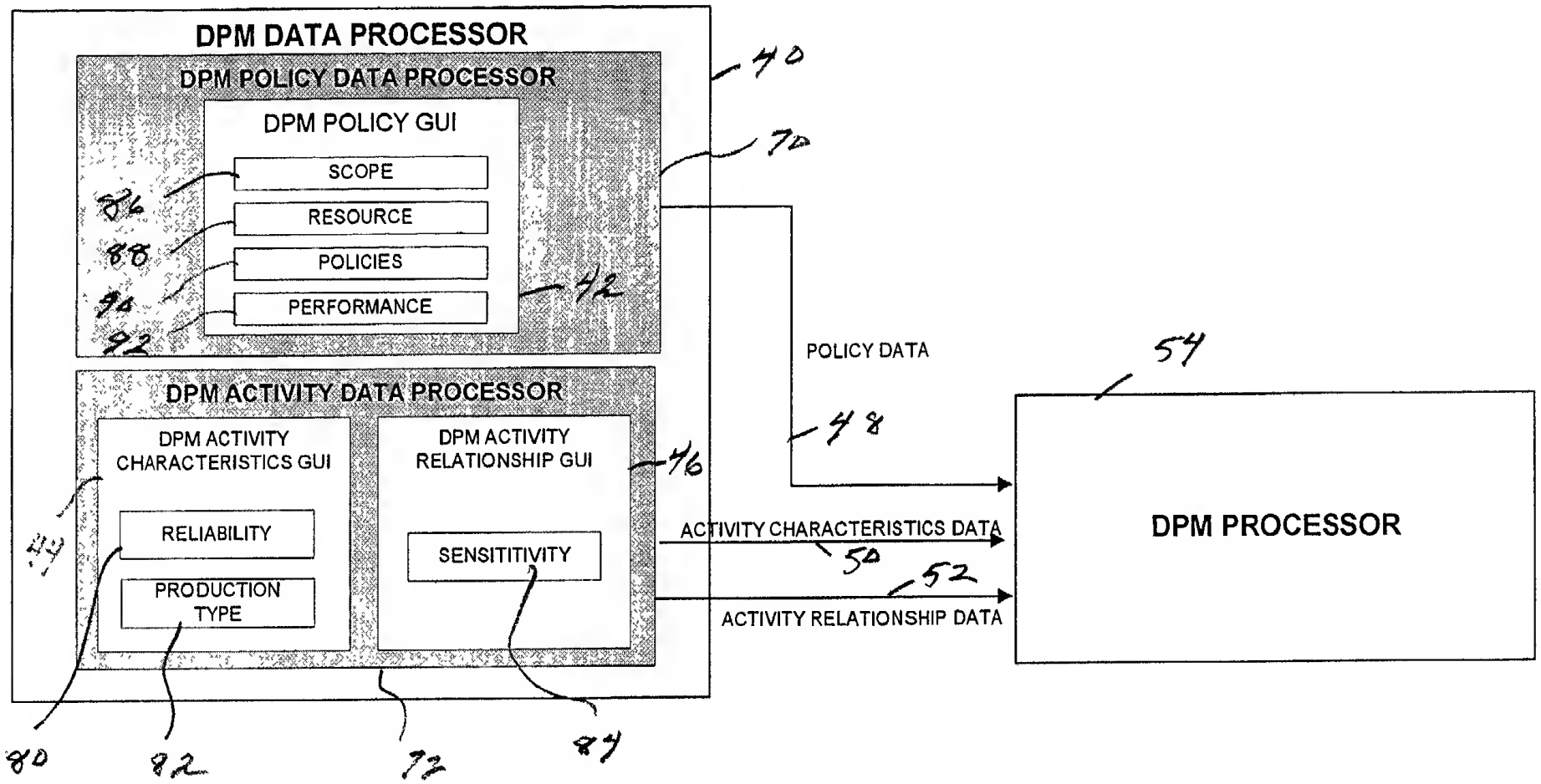

DPM DATA PROCESSOR
DPM POLICY DATA PROCESSOR
DPM POLICY GUI
SCOPE
RESOURCE
POLICIES
PERFORMANCE
DPM ACTIVITY DATA PROCESSOR
DPM ACTIVITY CHARACTERISTICS GUI
RELIABILITY
PRODUCTION TYPE
DPM ACTIVITY RELATIONSHIP GUI
SENSITITIVITY
POLICY DATA
ACTIVITY CHARACTERISTICS DATA
ACTIVITY RELATIONSHIP DATA
DPM PROCESSOR
40
70
42
54
48
46
50
52
80
82
72
84

FIG. 3

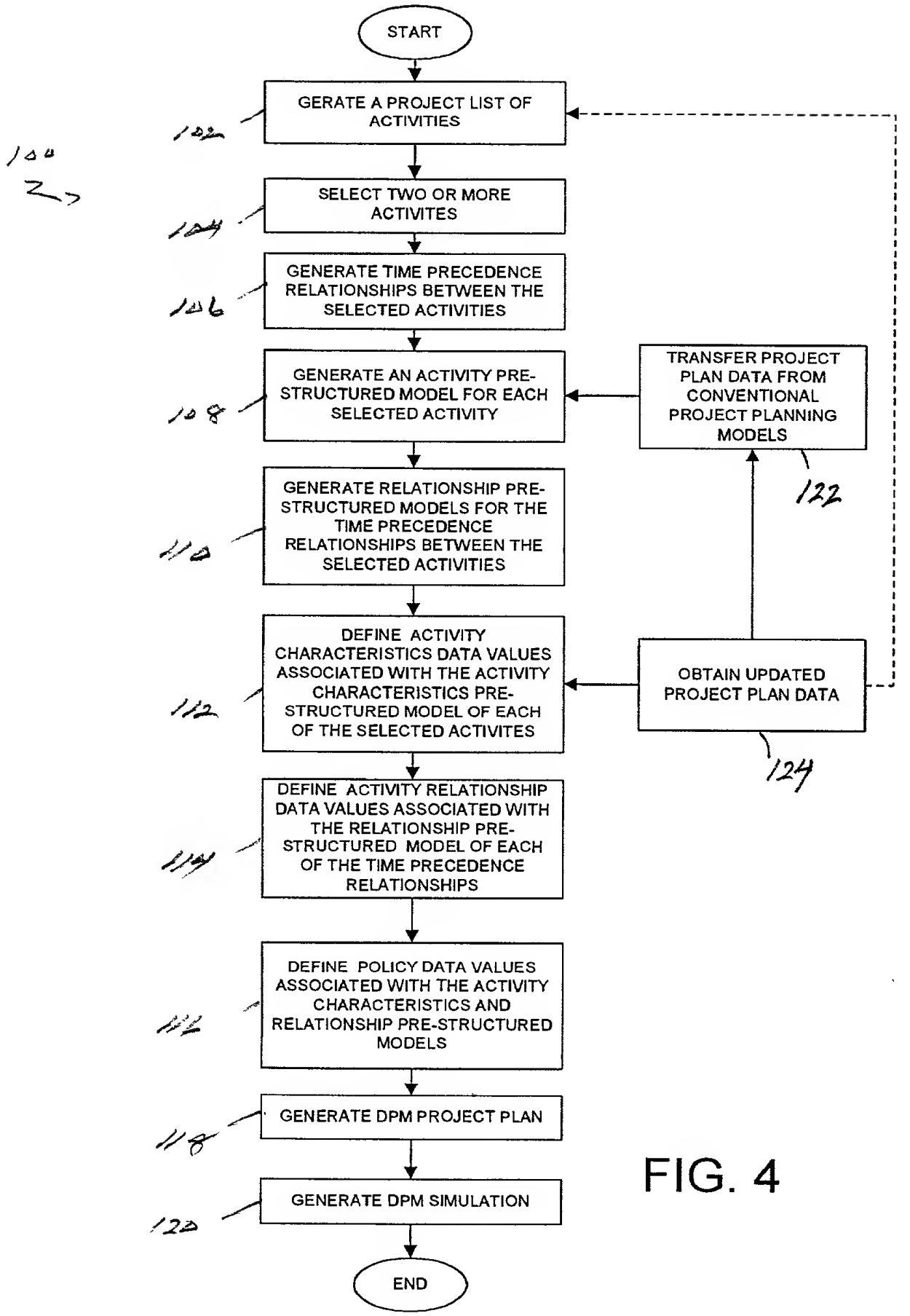

START
GERATE A PROJECT LIST OF ACTIVITIES
SELECT TWO OR MORE ACTIVITES
GENERATE TIME PRECEDENCE RELATIONSHIPS BETWEEN THE SELECTED ACTIVITIES
GENERATE AN ACTIVITY PRE-STRUCTURED MODEL FOR EACH SELECTED ACTIVITY
TRANSFER PROJECT PLAN DATA FROM CONVENTIONAL PROJECT PLANNING MODELS
122
GENERATE RELATIONSHIP PRE-STRUCTURED MODELS FOR THE TIME PRECEDENCE RELATIONSHIPS BETWEEN THE SELECTED ACTIVITIES
DEFINE ACTIVITY CHARACTERISTICS DATA VALUES ASSOCIATED WITH THE ACTIVITY CHARACTERISTICS PRE-STRUCTURED MODEL OF EACH OF THE SELECTED ACTIVITES
OBTAIN UPDATED PROJECT PLAN DATA
124
DEFINE ACTIVITY RELATIONSHIP DATA VALUES ASSOCIATED WITH THE RELATIONSHIP PRE-STRUCTURED MODEL OF EACH OF THE TIME PRECEDENCE RELATIONSHIPS
DEFINE POLICY DATA VALUES ASSOCIATED WITH THE ACTIVITY CHARACTERISTICS AND RELATIONSHIP PRE-STRUCTURED MODELS
GENERATE DPM PROJECT PLAN
GENERATE DPM SIMULATION
END

FIG. 4

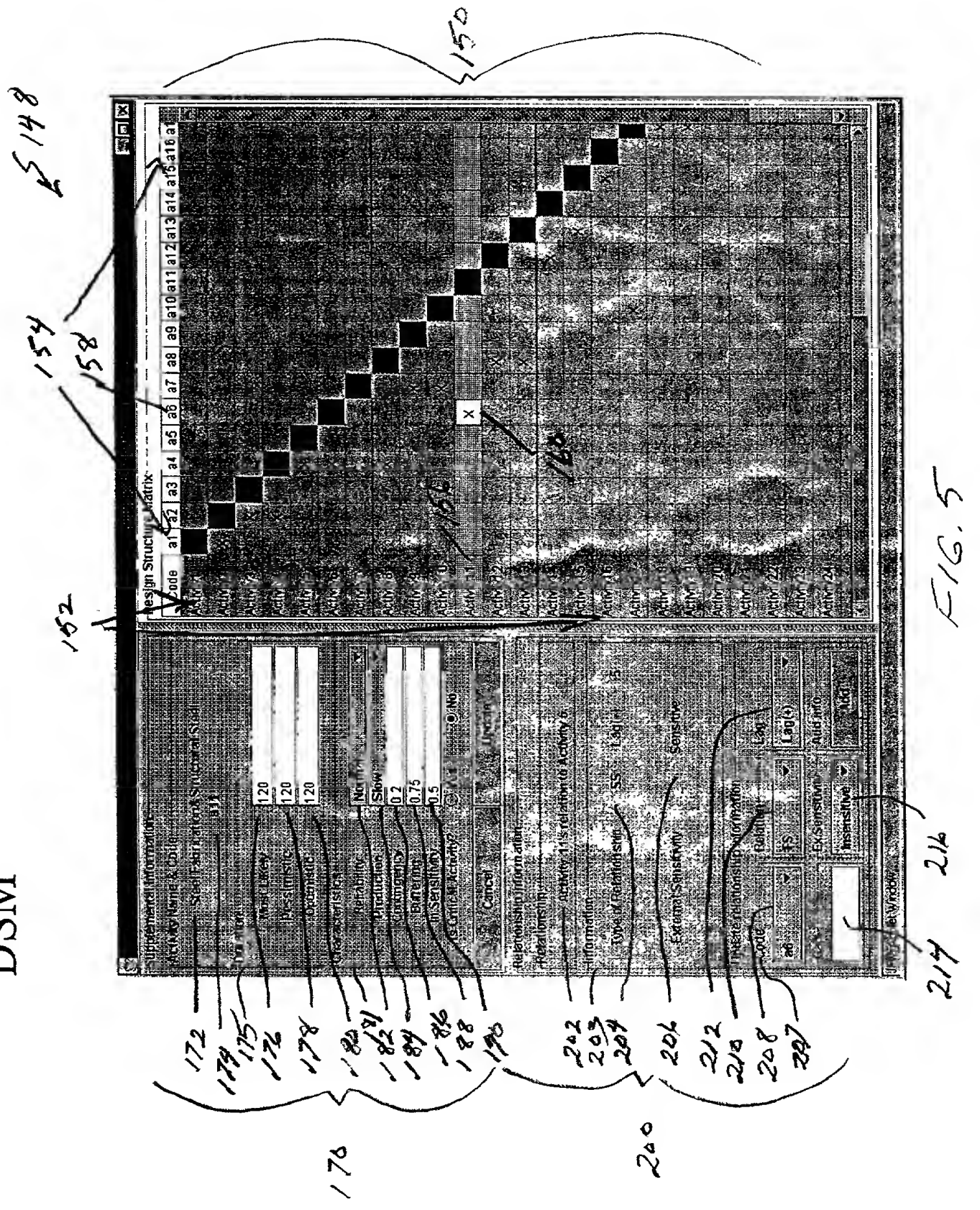

DSM
Design Structure Matrix
Code
Activity Name
Activity ID
Duration
Optimistic
Most Likely
Pessimistic
Probability
Criticality
Sensitivity
Cancel
Relationship Information
Relationships
Information
Type of Relationship
External Sensitivity
Insert Relationship
Code
Lag
Add Info
Delete
Insensitive
Lag(+)
Lag(-)
FS
SS
No
Show
Normal
120
0.2
0.75
0.5
152
154
158
150
148
168
170
172
174
175
176
178
180
182
184
186
188
190
200
202
203
204
206
208
210
212
214
216

FIG. 5

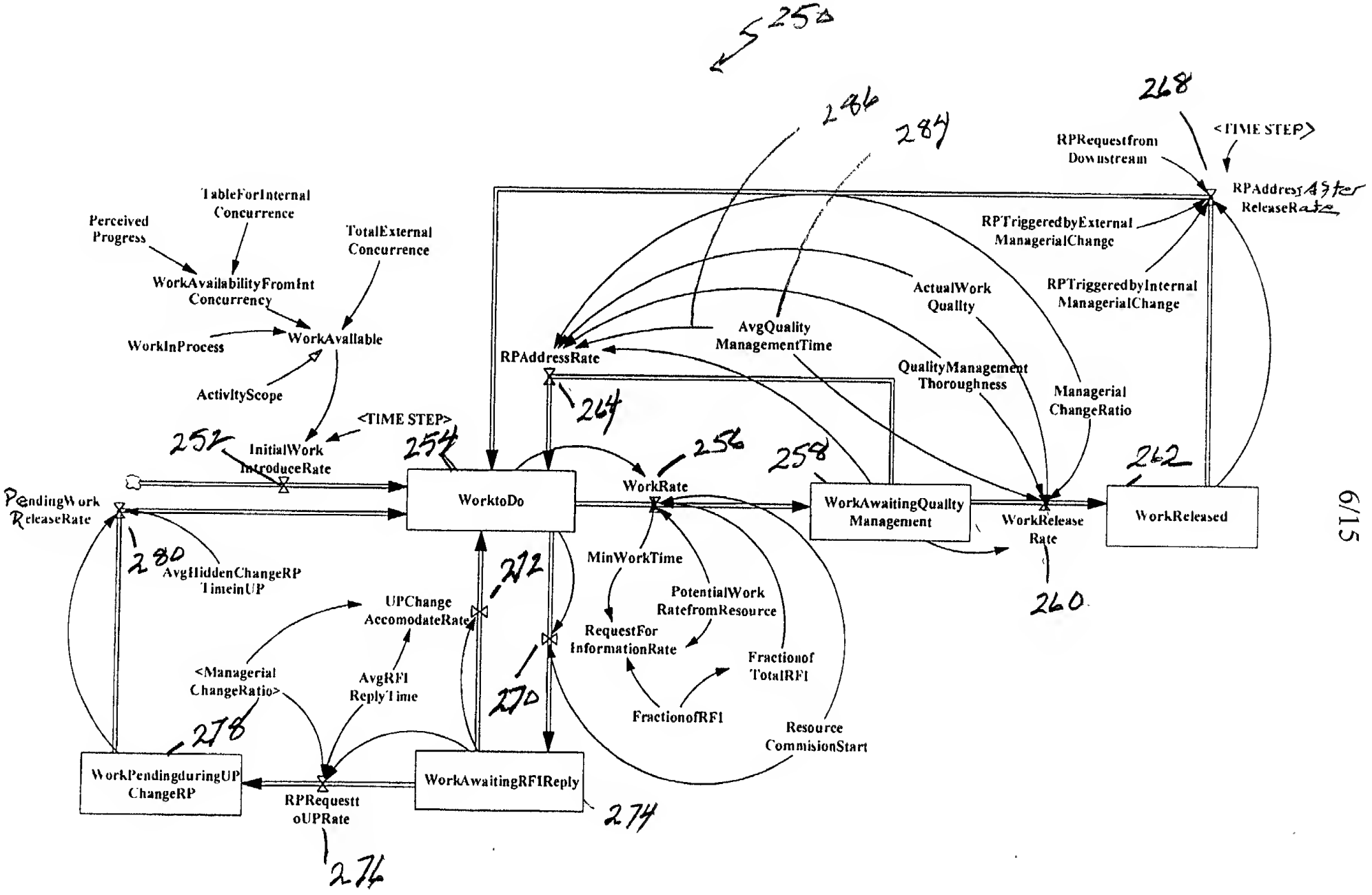

250
286
284
268
RPRequestfrom Downstream
<TIME STEP>
RPAddressAfter ReleaseRate
TableForInternal Concurrence
Perceived Progress
TotalExternal Concurrence
WorkAvailabilityFromInt Concurrency
WorkInProcess
WorkAvallable
ActivltyScope
RPTriggeredbyExternal ManagerialChange
RPTriggeredbyInternal ManagerialChange
ActualWork Quallty
AvgQuality ManagementTime
RPAddressRate
264
QualityManagement Thoroughness
Managerial ChangeRatio
252
InitialWork IntroduceRate
<TIME STEP>
254
256
258
262
PendingWork ReleaseRate
WorktoDo
WorkRate
WorkAwaitingQuallty Management
WorkRelease Rate
WorkReleased
280
AvgHiddenChangeRP TimeinUP
272
MinWorkTime
PotentialWork RatefromResource
260
UPChange AccomodateRate
RequestFor InformationRate
Fractionof TotalRFI
<Managerial ChangeRatio>
AvgRFI ReplyTime
270
FractionofRFI
Resource CommisionStart
278
WorkPendingduringUP ChangeRP
WorkAwaitingRFIReply
RPRequestt oUPRate
274
276

FIG. 6

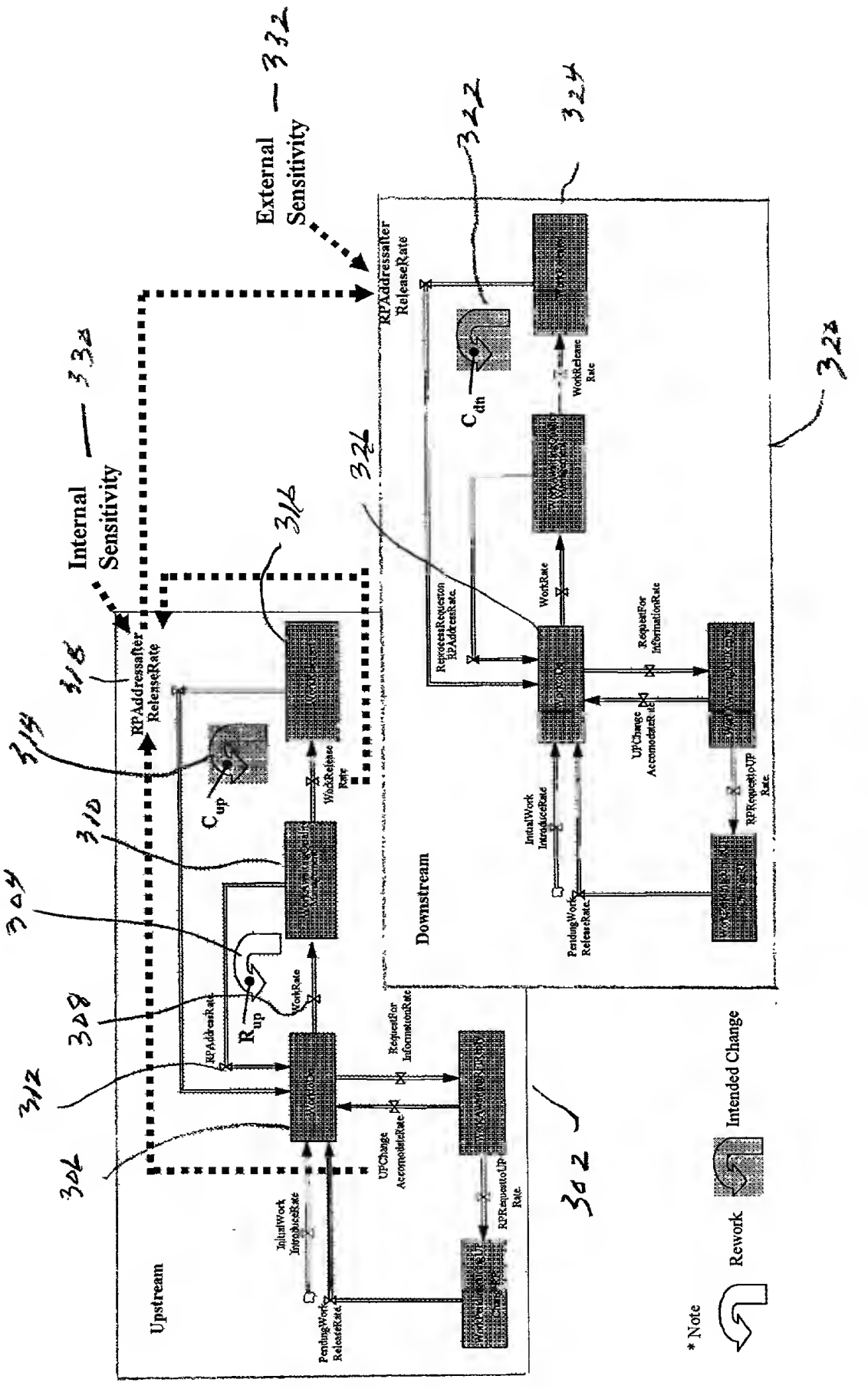

External Sensitivity
Internal Sensitivity
Upstream
Downstream
RPAddressafter ReleaseRate
WorkRelease Rate
WorkRate
RequestFor InformationRate
UPChange AccomodateRate
InitialWork IntroduceRate
PendingWork ReleaseRate
RPRequesttoUP Rate
ReprocessRequestonRPAddressRate
C_{up}
C_{dn}
R_{up}
* Note
Rework
Intended Change

FIG. 3

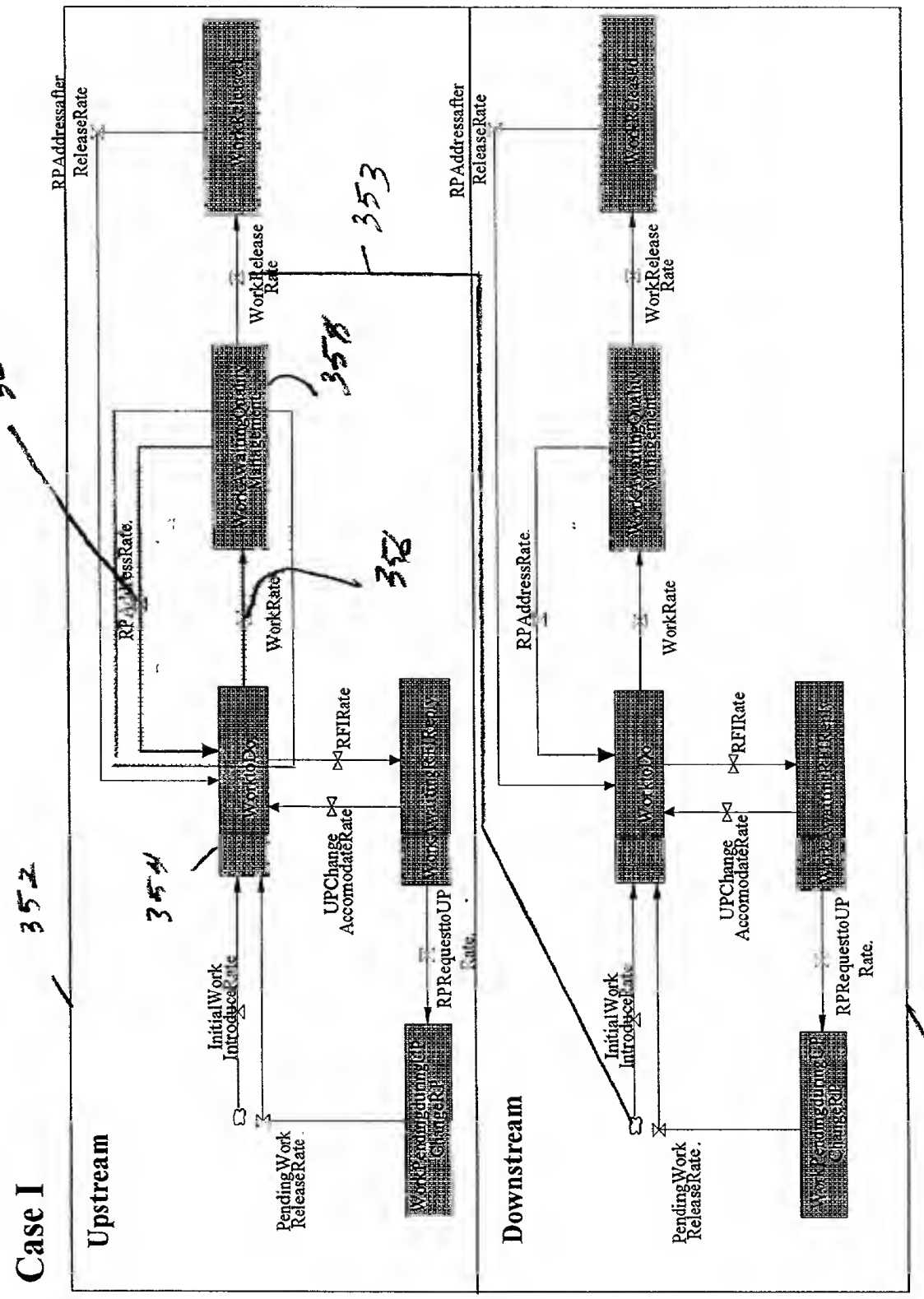

Case I
Upstream
Downstream
RPAddressafter ReleaseRate
RPAddressRate.
WorkRate
WorkReleaseRate
WorkReleased
Work Awaiting Quality Management
Work Undergoing QM
InitialWork IntroduceRate
PendingWork ReleaseRate.
UPChange AccomodateRate
RFIRate
RPRequesttoUP Rate.
Work Undergoing UP Change RP
Work Awaiting UP Change RP
350
352
354
358
360
362
353

FIG. 8

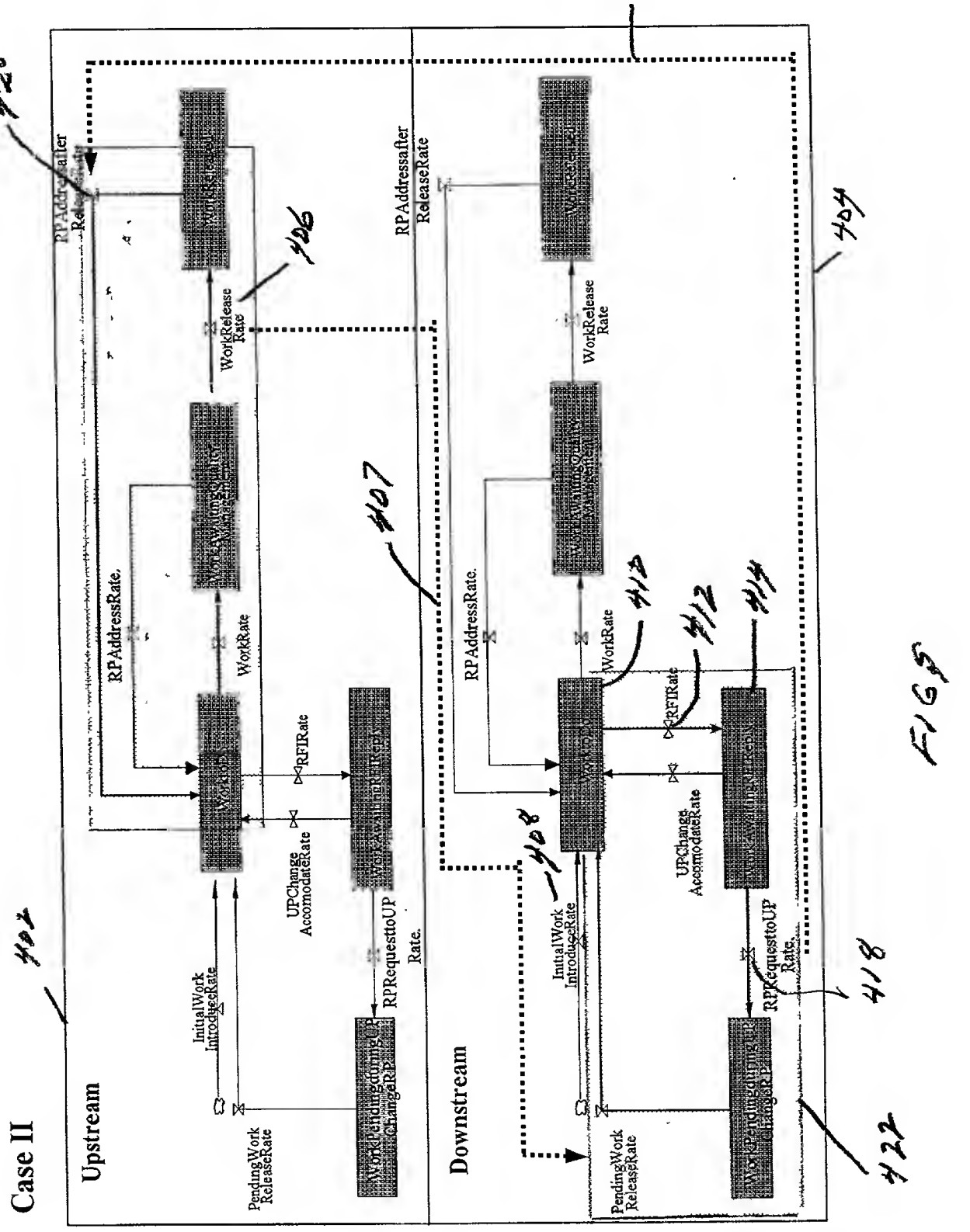

Case II
Upstream
Downstream
RPAddressafter ReleaseRate
WorkRelease Rate
InitialWork IntroduceRate
PendingWork ReleaseRate
UPChange AccomodateRate
RFIRate
RPRequesttoUP Rate.
RPAddressRate.
WorkRate

FIG 5

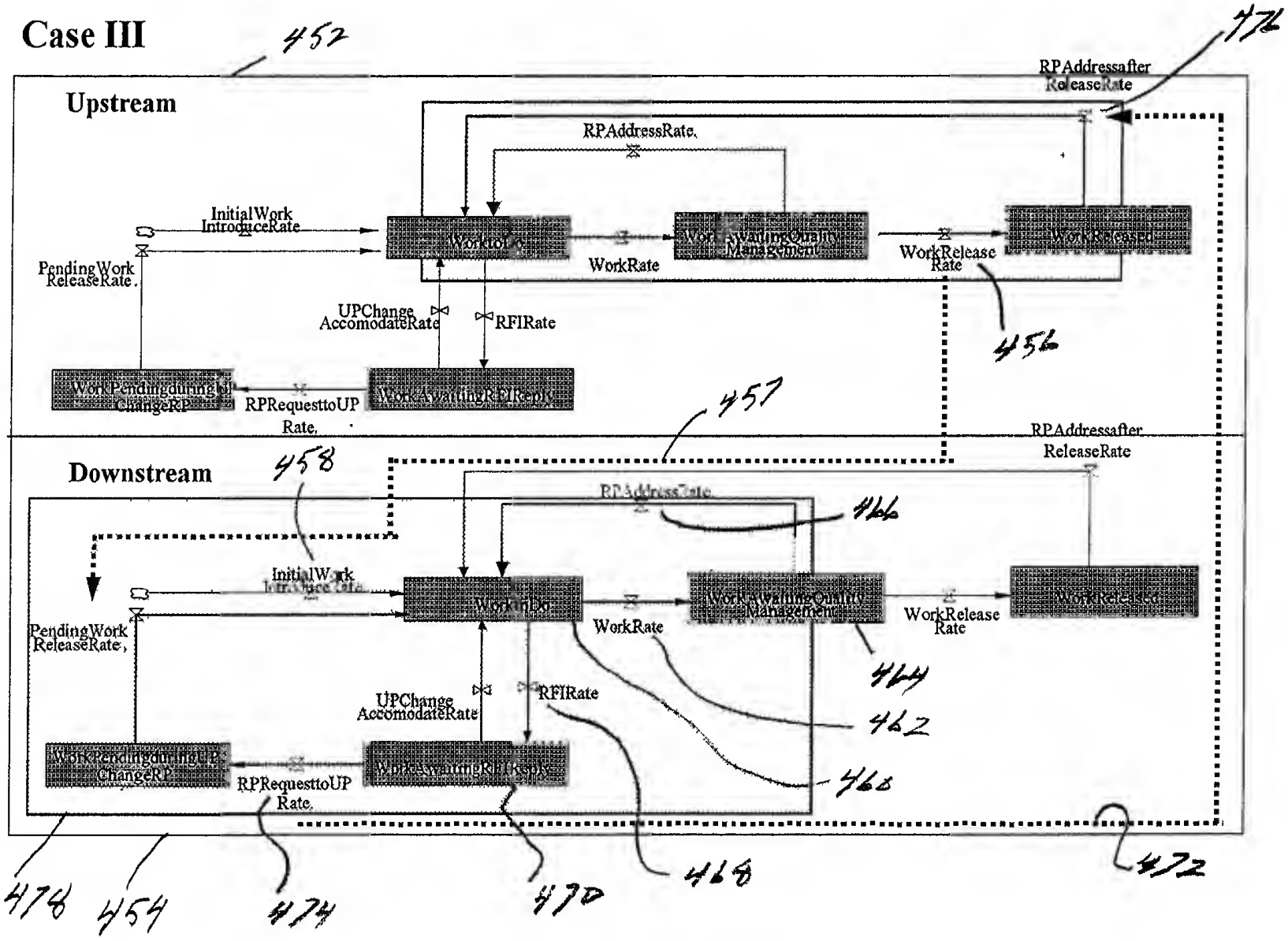
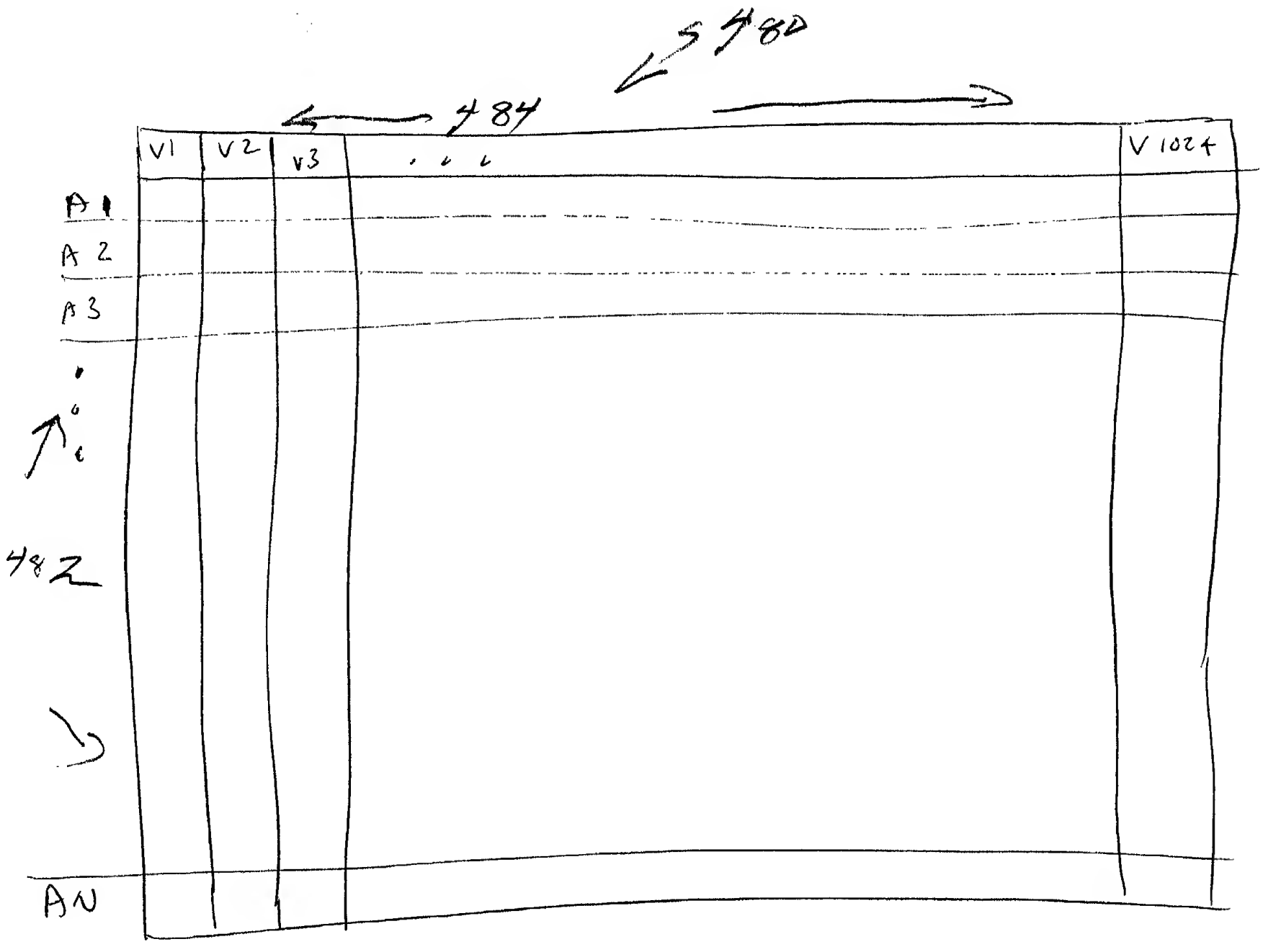

450
Case III
452
476
Upstream
RPAddressafter ReleaseRate
RPAddressRate
Initial Work IntroduceRate
Pending Work ReleaseRate
WorkRate
WorkRelease Rate
456
UPChange AccomodateRate
RFIRate
RPRequesttoUP Rate
457
458
Downstream
RPAddressafter ReleaseRate
466
Initial Work
Pending Work ReleaseRate
WorkRate
WorkRelease Rate
464
462
468
UPChange AccomodateRate
RFIRate
470
474
454
478
472

FIG. 4B



PRE- STRUCTURED MODEL VARIABLES Fig. 11

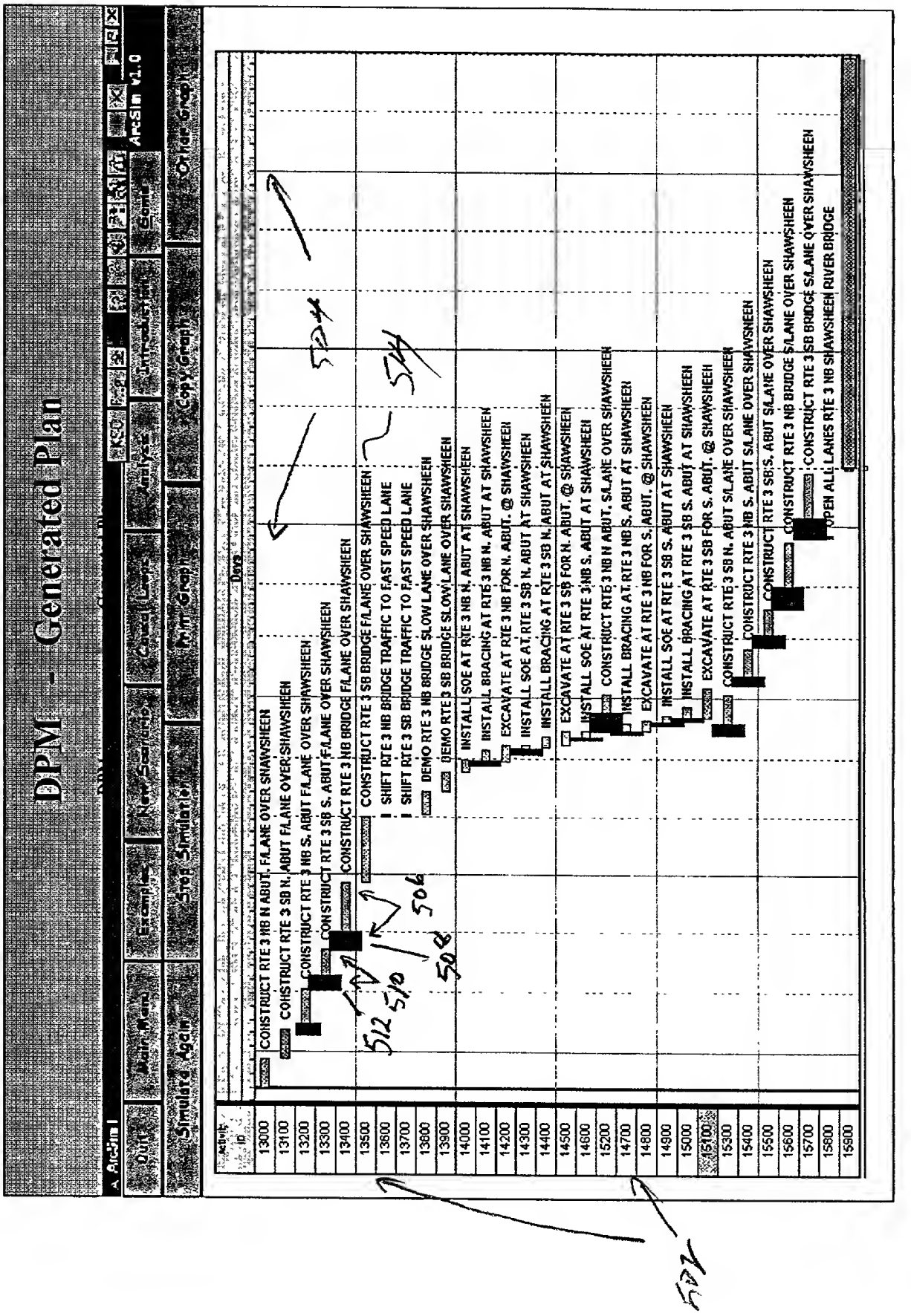

DPM - Generated Plan
ArcSim v1.0
Quit
Main Menu
Examples
New Scenario
Create Data
Simulate Again
Step Simulation
Run Graph
Copy Graph
Other Graphs
Activity ID
Days
CONSTRUCT RTE 3 NB N ABUT. F/LANE OVER SHAWSHEEN
CONSTRUCT RTE 3 SB N. ABUT F/LANE OVER SHAWSHEEN
CONSTRUCT RTE 3 NB S. ABUT F/LANE OVER SHAWSHEEN
CONSTRUCT RTE 3 SB S. ABUT F/LANE OVER SHAWSHEEN
CONSTRUCT RTE 3 NB BRIDGE F/LANE OVER SHAWSHEEN
CONSTRUCT RTE 3 SB BRIDGE F/LANE OVER SHAWSHEEN
SHIFT RTE 3 NB BRIDGE TRAFFIC TO FAST SPEED LANE
SHIFT RTE 3 SB BRIDGE TRAFFIC TO FAST SPEED LANE
DEMO RTE 3 NB BRIDGE SLOW LANE OVER SHAWSHEEN
DEMO RTE 3 SB BRIDGE SLOW LANE OVER SHAWSHEEN
INSTALL SOE AT RTE 3 NB N. ABUT AT SHAWSHEEN
INSTALL BRACING AT RTE 3 NB N. ABUT AT SHAWSHEEN
EXCAVATE AT RTE 3 NB FOR N. ABUT. @ SHAWSHEEN
INSTALL SOE AT RTE 3 SB N. ABUT AT SHAWSHEEN
INSTALL BRACING AT RTE 3 SB N. ABUT AT SHAWSHEEN
EXCAVATE AT RTE 3 SB FOR N. ABUT. @ SHAWSHEEN
INSTALL SOE AT RTE 3 NB S. ABUT AT SHAWSHEEN
CONSTRUCT RTE 3 NB N ABUT. S/LANE OVER SHAWSHEEN
INSTALL BRACING AT RTE 3 NB S. ABUT AT SHAWSHEEN
EXCAVATE AT RTE 3 NB FOR S. ABUT. @ SHAWSHEEN
INSTALL SOE AT RTE 3 SB S. ABUT AT SHAWSHEEN
INSTALL BRACING AT RTE 3 SB S. ABUT AT SHAWSHEEN
EXCAVATE AT RTE 3 SB FOR S. ABUT. @ SHAWSHEEN
CONSTRUCT RTE 3 NB S. ABUT S/LANE OVER SHAWSNEEN
CONSTRUCT RTE 3 SB S. ABUT S/LANE OVER SHAWSHEEN
CONSTRUCT RTE 3 SB N. ABUT S/LANE OVER SHAWSHEEN
CONSTRUCT RTE 3 NB BRIDGE S/LANE OVER SHAWSHEEN
CONSTRUCT RTE 3 SB BRIDGE S/LANE OVER SHAWSHEEN
OPEN ALL LANES RTE 3 NB SHAWSHEEN RIVER BRIDGE

FIG. 12

Simulation Output - 1

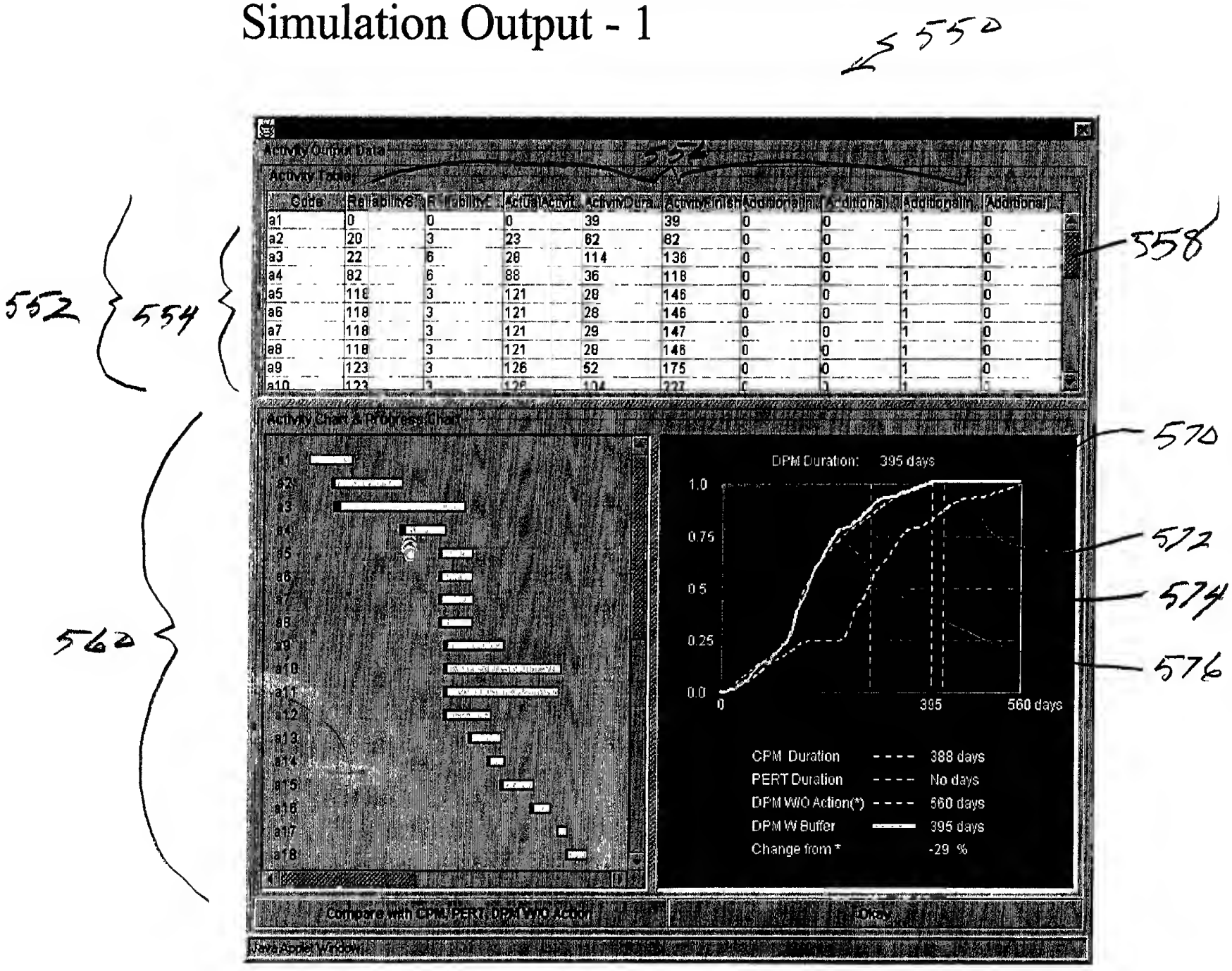


FIG. 13

Simulation Output - 2

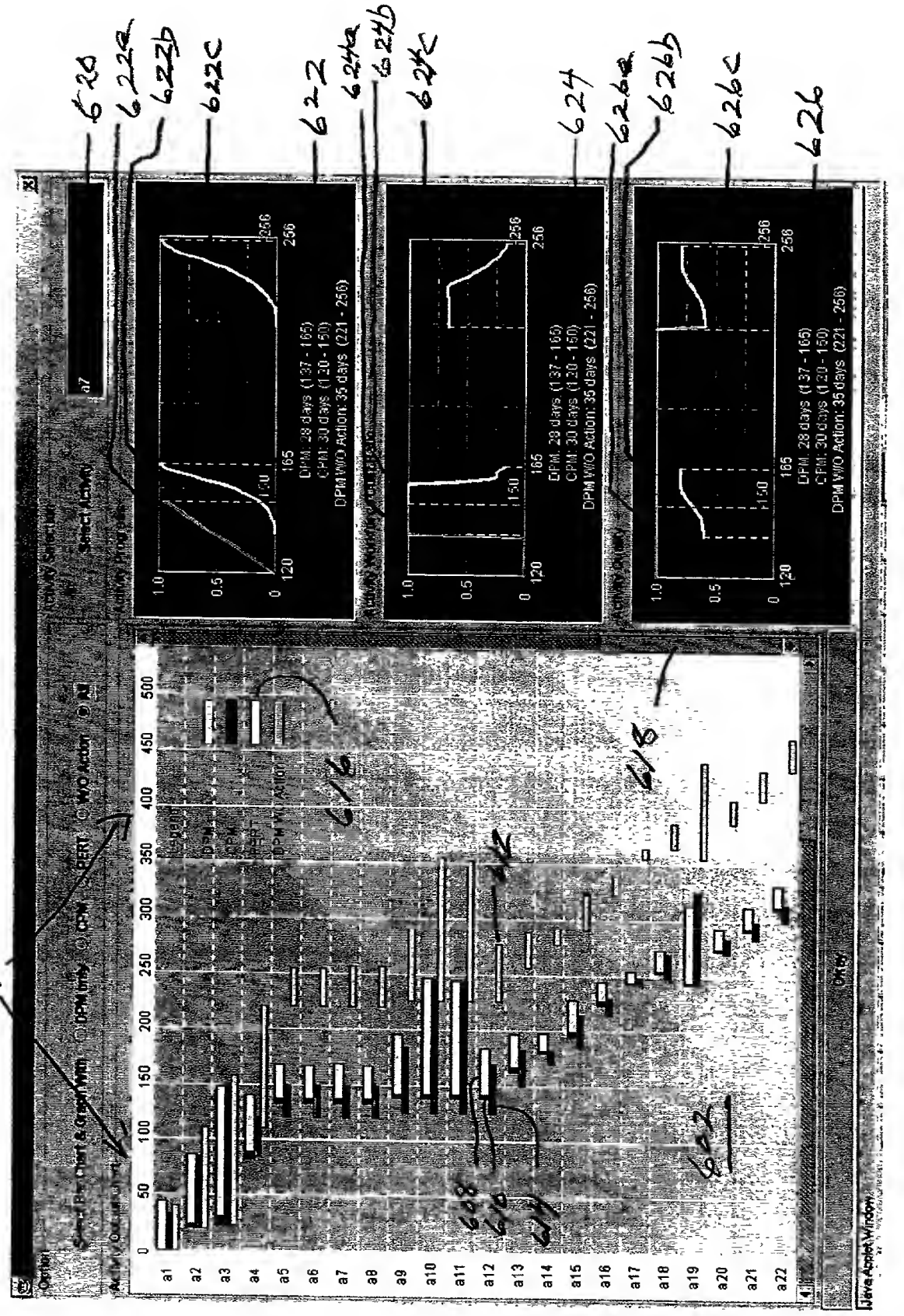


FIG. 14

Game Mode Simulation

650

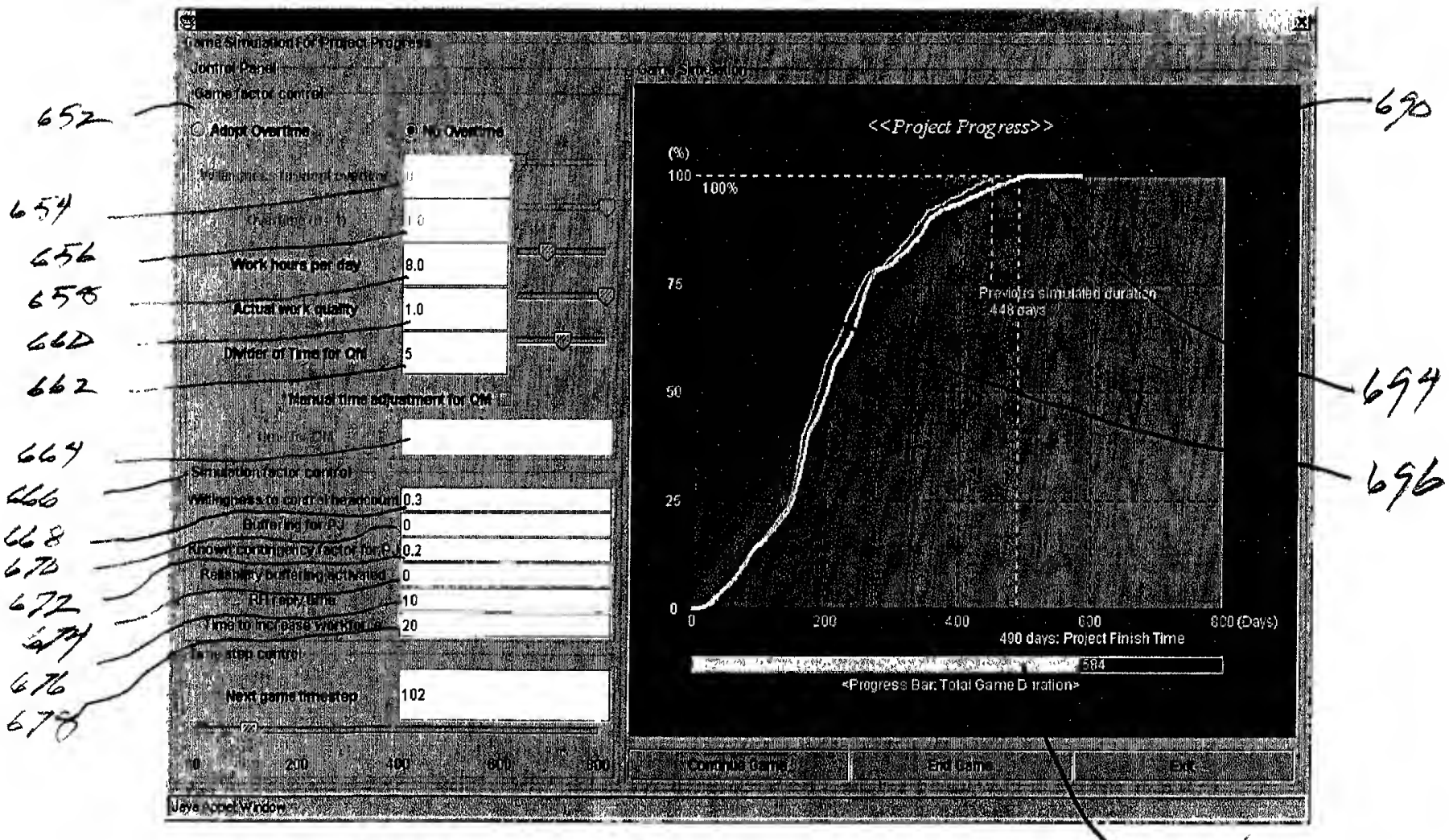


FIG. 15